Claims

[c1] 1. A large scale cleaning plug system adaptable to be placed within an interior passageway of a tubular system, the plug comprising:

a skeletal frame structure adapted to support an outer skin member for containing and directing a fluid through an interior central passageway formed in the skeletal frame structure; the skeletal frame structure having a first end and an opposing second end; the first end being upstream of the second end in relation to a fluid flow path through the interior passageway of the tubular system during operation of the large scale cleaning plug and the first end formed having an opening therethrough for the passage of the fluid;

the skeletal frame structure formed having a middle segment comprising a generally frustoconical shaped bottom element having a first end and a truncated opposite second end; said first end and said second end of the middle segment having a width selected to fit within the interior passageway of the tubular system;

securing means connected to the skeletal frame structure in proximity to the first end for controllably securing the skeletal frame structure in desired positions within the interior passageway of the tubular system; and,

the second end of the skeletal frame structure formed having a rear segment supporting at least one nozzle assembly; said nozzle assembly having at least one nozzle body extending from a plate preventing appreciable fluid flow therethrough and permitting a desired fluid flow through an exit opening of the nozzle bodies.

[c2] 2. The invention of claim 1 in which the middle segment is formed having an exterior skin member composed of a flexible material.

[c3] 3. The invention of claim 1 wherein the middle segment includes an exterior skin member formed of a plastic.

[c4] 4. The invention of claim 1 wherein the middle segment is formed having an exterior skin member composed of a material essentially impervious to the fluid flow.

[c5] 5. The invention of claim 1 further wherein the first end of the skeletal frame structure has an apron portion surrounding at least a portion of the opening formed in the first end of the skeletal frame; the apron portion adapted to controllably block the fluid flow during operation of the cleaning plug within the interior passageway of the tubular system.

[c6] 6. The invention of claim 5 wherein the apron is formed having a plurality of independent segments.

[c7] 7. The invention of claim 6 wherein one or more segments of the apron can be controllably positioned to permit a desired fluid flow past the cleaning plug.

[c8] 8. The invention of claim 1 wherein the skeletal frame structure is adapted to be disassembled into component members suitable for passing through an opening smaller than the interior passageway of the tubular system and to be reassembled within the interior passageway of the tubular system.

[c9] 9. The invention of claim 1 wherein the nozzle bodies are comprise generally frustoconical shaped members extending from a plate member preventing appreciable fluid flow therethrough and permitting a desired fluid flow through an exit opening of the middle segment.

[c10] 10. The invention of claim 1 wherein the nozzle bodies include a check

valve.

[c11] 11. The invention of claim 1 wherein the nozzle bodies are composed of rubber.

[c12] 12. The invention of claim 1 wherein the tubular system is a known sewer system pipe.

[c13] 13. The invention of claim 1 wherein the second end of the middle segment has a width less than the width of the first end.

[c14] 14. The invention of claim 1 wherein the nozzle assembly is pivotally mounted to the conical element.

[c15] 15. The invention of claim 1 further including rollers mounted with the middle segment to support the cleaning plug in the interior passageway of the tubular system.

[c16] 16. The invention of claim 1 wherein a top portion of the first end of the skeletal frame structure is adapted to permit a controlled amount of fluid flow over the middle segment.

[c17] 17. The invention of claim 16 further including a segmented apron mounted in proximity to the first end of the skeletal frame structure and surrounding a portion of the opening formed in the first end of the skeletal frame structure and one or more segment of the apron being controllably positioned to permit the fluid flow over the middle segment.

[c18] 18. The invention of claim 1 wherein the middle segment has a flattened upper surface.